

NASA TECH BRIEF

Marshall Space Flight Center



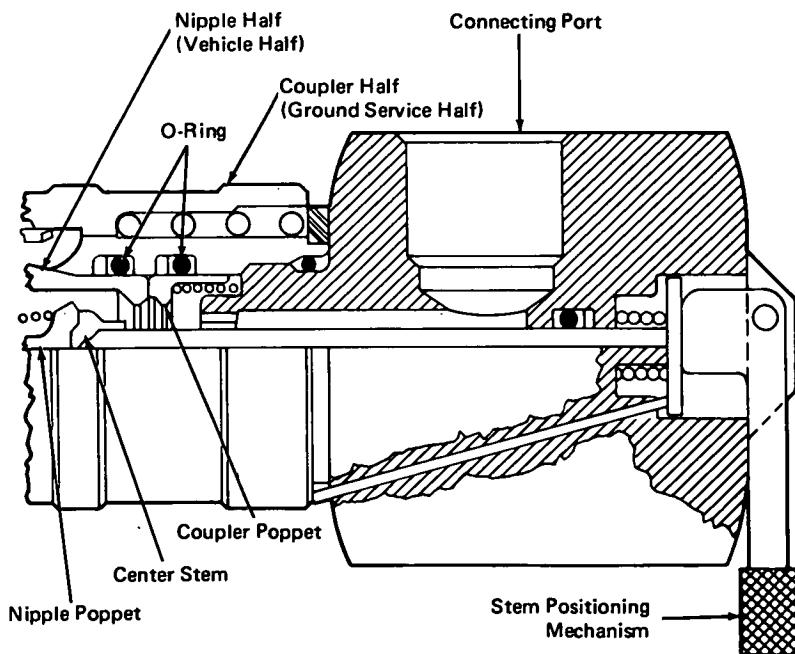
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Fill And Vent Quick Disconnect

A modification to standard quick disconnect couplings, which are used in hydraulic and pneumatic hardware, provides a method of checking whether or not the nipple poppet has closed on disconnection. It is possible to use standard off-the-shelf, self-sealing quick disconnects with pressurized systems; however, past performances have shown that they can fail to open upon disconnection. Such a failure, for example, can cause the coolant in the refrigeration systems of space vehicles to spill on a surface after which it is difficult to remove. As a result, a quick disconnect is needed that could be connected without opening the self-sealing poppet on the vehicle half. Once the connection is made and verified, the poppet would then be manually opened by some device on the quick disconnect. Another requirement is that the self-sealing poppet on the ground servicing half be always opened

upon connection, if only very slightly, regardless of the setting of the device that positions the vehicle half poppet. The reason for this is that it is necessary to verify the integrity of the vehicle half poppet seal prior to disconnection. This would be done by manually closing the poppet on the vehicle half and depressurizing the ground servicing half. Whether or not the vehicle system holds pressure would then be noted. Furthermore, it is required that the poppets in both halves of the quick disconnect seal in the event of an inadvertent disconnection regardless of the setting of the device that positions the vehicle half poppet.

To fulfill these requirements, only the coupler half of the quick disconnect was modified, as shown in the illustration. The center stem of the coupler was made movable, thus allowing the nipple poppet to move. The



(continued overleaf)

coupler poppet was modified, the sealing surface being recessed to insure that the poppet would not seal on the stem when the stem was fully retracted. This stem is retracted to allow the nipple poppet to close and seal. An O-ring was added to seal the poppet when the stem is in the retracted position and the coupler is disconnected. The poppet will close and seal against the stem upon disconnection just as it does in the unmodified coupler. The connecting port was brought out the side to allow the stem positioning mechanism to be on the end of the coupler.

Notes:

1. Information concerning this innovation may be of interest to manufacturers of refrigeration systems and those working with systems utilizing hazardous fluids.

2. Requests for further information may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Code A&PS-TU
Marshall Space Flight Center, Alabama 35812
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Patent status:

NASA has decided not to apply for a patent.

Source: R. Y. Boerner and R. W. Hedrick of
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